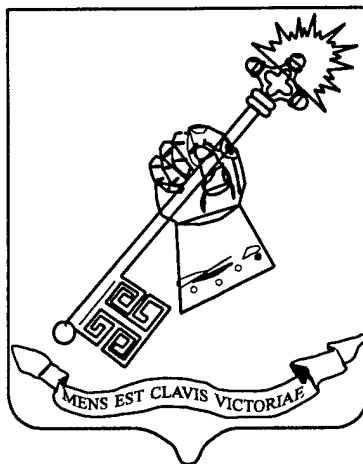


COMMAND AND CONTROL OF DIVISION DEEP ATTACKS

A Monograph
By
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Field Artillery



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First Term AY 95-96

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 14 December 1995		3. REPORT TYPE AND DATES COVERED MONOGRAPH
4. TITLE AND SUBTITLE Command and Control of Division Deep Attacks			5. FUNDING NUMBERS	
6. AUTHOR(S) MAJ Leonard G. Tisher, Jr, USA				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School of Advanced Military Studies Command and General Staff College Fort Leavenworth, Kansas 66027			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Command and General Staff College Fort Leavenworth, Kansas 66027			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) SEE ATTACHED				
14. SUBJECT TERMS Deep Attacks Deep Operations			15. NUMBER OF PAGES 51	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

ABSTRACT

COMMAND AND CONTROL OF DIVISION DEEP ATTACKS by
MAJ Leonard G. Tokar, Jr., USA. 51 pages.

This monograph discusses how the division staff can become better organized and equipped for planning and controlling deep attacks, to increase mission effectiveness and speed coordination. The U.S. Army is experiencing this problem in organizing the division staff to plan and control operations involving the new long-range weapons that are organic to the division as well as those available from corps or joint headquarters.

This monograph first examines how divisions conducted deep attacks during Operation Desert Storm, given the new capabilities of the enhanced-range weapons, such as the AH-64 Apache and the MLRS. It then discusses the new emphasis on deep attacks at the National Training Center and Battle Command Training Program to highlight problems in deep operations.

Finally, this paper focuses on the preceding issues to argue that divisions need a standardized organizational structure to meet the requirements of planning deep attacks. The emerging doctrine gives the division commander latitude in determining how to form a Deep Operation Coordination Cell. This paper discusses the need for standardized organization and duties for a DOCC at a division.

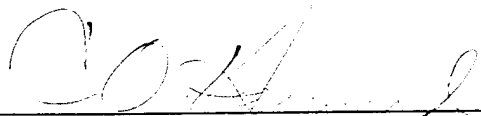
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MONOGRAPH APPROVAL

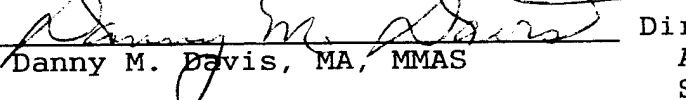
Major Leonard G. Tokar, Jr.

Title of Monograph: Command and Control of Division Deep
Attacks

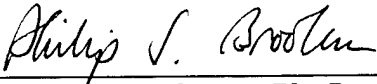
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Accepted this 14th Day of December 1995

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I. Introduction

New weapons of warfare call for the total and radical reorganization of methods of warfare, and he who falls asleep during this process may never wake up. - Mikhail Tukhachevskiy

This quote¹ highlights the struggle between introducing new weapons and developing a doctrine for their implementation. The U.S. Army is experiencing this problem in organizing the division staff to plan and control operations involving the new long-range weapons organic to the division as well as those available from corps or joint headquarters.

Army doctrine is not clear on planning responsibilities and control duties for divisional deep attacks. Divisions can plan and execute deep attacks and achieve tremendous results by recognizing the dynamic complexity of the operation and employing various techniques or procedures. The shortcoming is that the procedures are not uniform between divisions, nor usually standardized within divisions.

Cohen and Gooch discuss the three basic kinds of failure as in learning, anticipating and adapting. Learning is based on analyzing the changes in the

environment and then anticipating the effects on operations in the future. The Army has recognized that the environment has changed with the enhancement of sustained deep battle at the division level. To adapt to the new environment the division commanders need to make changes to the organizational structures of their division staff to accommodate the increasing complexities of coordinating deep attacks.

A deep operation requires unity of effort by several players. These players are linked together in an operation that requires precise prediction of enemy activities, synchronization with the close battle and supporting operating systems, and extended communications. Given the dynamic complexity of deep operations, this paper will explore how the division staff can become better organized and equipped for planning and controlling deep attacks, to increase mission effectiveness and speed coordination.

In Operation Desert Storm division commanders had organic weapons and access to intelligence collection to expand their physical reach on the battlefield beyond the committed first echelon enemy units. Commanders discovered that the division staffs were not organized to plan for simultaneous and continuous deep and close operations. The execution of a deep attack required detailed coordination with multiple subordinate and supporting units.

The Combat Training Centers created scenarios to study

the requirements for coordination and synchronization in a collective training environment. The targeting, triggering and cross-FLOT penetration of a deep attack required centralized control and liaison for success.

Emerging doctrine at the division level is requiring division commanders to organize a Deep Operations Coordination Cell (DOCC) to plan and execute deep attacks. The limitation in forming a DOCC is related to personnel and equipment shortages.

This paper will focus on the preceding issues to argue that divisions need a standardized organizational structure to meet the requirements of planning deep attacks. The emerging doctrine gives the division commander latitude in determining how to form a DOCC. This paper will discuss the need for standardized organization and duties for a DOCC at a division.

II. Doctrinal Analysis

"Deep operations are those directed against enemy forces and functions beyond the close battle. They are executed at all levels with fires, maneuver, and leadership...They expand the battlefield in space and time to the full extent of friendly capabilities. Effective deep operations facilitate overall mission success and enhance protection of the force."-FM 100-5.

The problem of commanding and controlling deep operations is not new to the U.S. Army. During the Second World War, European theater commanders deployed ground maneuver formations beyond the enemies' defenses. These commanders, such as Major General John S. Wood, adapted to the challenge of the changing nature of the battlefield by modifying their existing methods of command and control.

During the late 1980's, division commanders were presented with two technological innovations that would further expand the division's combat reach and again, change the nature of the battlefield. The first innovation was the Multiple Launch Rocket System (MLRS). The division commander replaced the aging M110A2 howitzers with nine rocket launchers, a responsive system that provided battalion-equivalent massed-fires to a range of 31

kilometers.

Although the launchers were able to emplace and fire within 3 minutes, bypassing the traditional manual fire control requirements, the most significant improvement was the means of achieving a battalion mass-effect from a single launcher. In terms of delivery, commanders could use a single MLRS platoon to fire target groups without sacrificing mass effects as happened with a cannon battalion engaging target groups.

The M110A2 howitzer had a maximum range of 30 kilometers with rocket-assisted projectiles. The munitions, however, were high-explosive only. The MLRS delivered a payload of Dual-Purpose Improved Conventional Munitions (DPICM). The division commander now had the capability to mass DPICM to a range of 31 kilometers. The division had a weapon to execute deep fires.

The second innovation was the AH-64 Apache attack helicopter. The AH-64 added the capability to conduct divisional deep maneuver without the extensive logistical requirements, extended time, or inherent risk of a deep ground maneuver. The AH-64 could strike at night and with an eight kilometer stand-off range.

The division replaced the AH-1 Cobra helicopters with the AH-64 Apache. The AH-1 was a day-use only aircraft, armed with TOW missiles. The drawback for the AH-1 was that it had to close within the range of its target's weapons in

daylight to engage. These aircraft limitations did not make it feasible to attack armor formations with AH-1s.

The AH-64 could detect and designate for laser-guided munitions, including Copperhead artillery projectiles and its own Hellfire missiles. The Hellfire missile had a probability of kill of greater than 90%. Each AH-64 could be equipped with sixteen missiles. A division could launch eighteen AH-64 helicopters, fully loaded with Hellfire missiles, to intercept and destroy a motorized rifle regiment.

The combination of the MLRS and the AH-64 has given the division the organic capability to conduct deep maneuver attacks with supporting fires during favorable weather conditions. The aviators can range beyond the forward line of troops with suppression of enemy air defenses (SEAD), if desired, and engage targets directly or indirectly (remote laser-designation) with supporting artillery fires in the engagement area.

The introduction of the MLRS and the AH-64 have expanded the divisional battlefield. The commander can conduct a synchronized fight in depth and with mass and precision. Prior to the introduction of these weapons the division had to consider deep ground maneuver packages for a deep fight. In addition to the previously mentioned problems of logistics, time and risk, the commander had to consider force tailoring. He had to determine if his

artillery could support an operation from the friendly side of the FLOT or if it must accompany the deep maneuver force. Although there is still vast potential for deep ground maneuver, the aviation option is now available.

How does a division commander designate deep from close fights? Separation between deep and close can be viewed as a function of force ratios, relative combat power and ranges of the weapon systems. The separation is based upon a line (phase line), beyond which, the brigades cannot influence the enemy with their organic and attached weapons and intelligence systems. Division assumes responsibility for all or part of the battle, or a specific target set or enemy capability. Two examples will illustrate the concept.

The first situation is a battle in which the enemy has a preponderance of artillery. The division possesses the acquisition means (TPQ-37 Fire Finder Radar) as well as the weapons to range and destroy the artillery (MLRS, Attack Helicopters). Division, therefore, assumes responsibility for engaging the enemy fire support capability. Division would place the dividing line geographically close to the brigades, with deep operations close in time and synchronized with the close fight.

In the second situation, the brigades have ample combat power to dominate the immediate threats. In this case division can focus on follow-on forces or reinforcements. Division will divide the battlefield, therefore, based on

geographic distance with deep operations concentrating on threat forces that will influence the future battle.

Divisions can define the deep battle in terms of physical distance as well as in time, or a combination of both. The linkage between close and deep is critical to maintain. Commanders need to understand both the close and deep battles, and how the results could influence their operations.

Before beginning a discussion on how to modify division structures to enhance deep operations, it is imperative to develop assumptions on why there is a requirement for divisions to fight in depth.

"The Army must fight as part of a joint, combined, United Nations, or interagency force. Combatant commanders seek the power inherent in joint operations by synchronizing the complementary war fighting capabilities of all the services and supporting commands into a unified effort." -FM 100-5.

An assumption, as dictated by FM 100-5 is that the Army will fight as part of a joint effort. The capabilities of the entire joint force will be synchronized to concentrate effects at the decisive point in combat. The enemy is subject to acquisition, tracking, engagement and assessment from a variety of systems that represent the capabilities of

the joint services. The leverage of technology enhances the links between the joint services for coordination of joint assets.

As part of a joint force, the U.S. Army division will fight with joint capabilities that will allow it to acquire and engage the enemy at a greater range and with more combat systems than with divisional organic weapons. Joint capabilities will enhance the supporting functions such as intelligence, fire support, logistics, air defense and aviation.

The U.S. Army division must be prepared to synchronize joint assets to apply the maximum effects on the enemy. To ensure proper application, coordination and synchronization, the division needs to understand the capabilities of the joint systems. The division should understand the linkages required with joint forces to employ the joint assets and any limitations or constraints associated with the employment of the assets. This will require the division to establish a form of communication for the coordinated use of joint assets. Communication could range from simple radio/telephone signals to liaison requirements. Potentially it could mean collocating operation centers. The complexity of the operation and the breadth of the augmenting joint assets or forces will help determine the level of communication required. The requirement, however, includes knowledge of the system and the linkages involved

in employment¹¹.

The first assumption, therefore, is that since the U.S. Army divisions will fight as part of a joint team, they will have the potential to employ joint assets that will increase the depth of the battlefield as well as the amount of firepower employed throughout the battlefield. Divisions must understand the employment concepts of the joint assets and establish communications with the joint provider.

The second assumption is that the U.S. Army division will fight the enemy throughout the depth of the battlefield simultaneously¹².

"Depth allows commanders to sustain momentum and take advantage of all available resources to press the fight, attacking enemy forces and capabilities simultaneously throughout the battlefield." - FM 100-5.

Given the extended capabilities to acquire and engage the enemy, the division can continuously execute close, deep and rear operations simultaneously. The concept of simultaneous engagement implies attacking committed and uncommitted enemy forces, lines of communications and logistics¹³.

"Whether in the offense or defense, division deep operations perform one or a combination of the following functions:

- Interdict enemy lines of communication.

- Prevent the employment of enemy counterattack or follow-on forces.

- Destroy supply bases or facilities.

- Cut off routes of withdrawal."-FM 71-100.

In order to maximize the effect of moral disintegration, the division can conduct concurrent attacks upon the enemy's combat forces, command and control and support. The massed effects occurring near-simultaneously will not only desynchronize the enemy and destroy equipment, it could serve to demoralize the ranks and have a decisive effect on close operations.

The division must recognize that simultaneous engagements require coordination between all aspects of the battlefield framework¹¹. Deep attacks can serve to alter the tempo of an enemy attack¹². They must, however, be linked to the close battle for handover responsibilities. In division offensive operations, deep attacks can intercept and destroy enemy counterattacking forces, but, the division must know where to apply force in the close fight to trigger the desired enemy reaction for the deep attack.

The key to understanding the difficulty in conducting

simultaneous operations is the aspect of continuous operations. The division deep fight must be ongoing. We have already assumed that joint assets will enhance the deep attack assets the division organically possesses permitting the continuous employment of assets. The difficulty for the division is constantly focusing across the depth of the battlefield for planning and control. A division staff must orient in depth in terms of physical distance and time. The division must conduct continuous planning and execution of deep attacks in addition to the commanders main focus: the close fight.

The second assumption, then, is that the division has the capability to fight the enemy in depth continuously and simultaneously. The difficulty with the ongoing deep fight is planning and executing current and future operations.

III. Perspectives: Deep Operation Control and Coordination in Combat and Training

This chapter will provide examples of deep attacks during Operation Desert Storm and at the National Training Center. The intent is to discuss the application of deep operations with the latest technology and highlight the coordination difficulties encountered.

Division Commanders during the Persian Gulf War applied the advanced weaponry to the Iraqi threat in an environment suited to deep operations. The vastness of the Iraqi desert and the enemy disposition offered the conditions for commanders to fight the enemy in echelon simultaneously as doctrine maintains. Commanders, however, focused their deep assets on the close fight to achieve maximum effects on what was considered the division main event. When commanders found it difficult to distinguish friendly from enemy forces and synchronize helicopters with armored vehicles, they extended their influence to the uncommitted enemy units.

Although the National Training Center trains brigades and battalions, it offers useful examples of the complexities of employing forces deep. The examples and problems discussed will demonstrate that divisions should develop an independent staff to coordinate and synchronize across the division for deep operations.

Operation Desert Storm provided the first combat

opportunity for heavy divisions to exercise deep attacks with the AH-64 and MLRS. The heavy divisions in VII and XVIII Airborne Corp were supplemented with Corps Artillery MLRS battalions and Corps Aviation attack battalions to press the fight against uncommitted enemy units. This discussion will reveal the difficulties encountered by heavy division commanders and staffs in coordinating the deep fight.

On 26 February, 1991, at approximately 1630 hours, the US Army's Third Armored Division made contact with elements of the Iraqi's Tawakalna Division. Major General Paul Funk attacked the Tawakalna with two brigades abreast. As the fight continued into the evening, the division's main attack, the 2d Brigade, commanded by Colonel William Higgins, was halted by the entrenched enemy armor. Colonel Higgins had one AH-64 company OPCON to his brigade and the division's MLRS battery, A-40 FA, in his lead battalion's formation, reinforcing his direct support artillery battalion.

Throughout this fight the attack helicopters and the MLRS augmented 2d Brigade's direct fires to attempt to destroy the Iraqi armor in a frontal assault. Early in the fight the MLRS battery had to reposition rearward two kilometers because it was too close to engage enemy artillery targets (MLRS minimum range in 1991 was 8 kilometers). The problem in using the attack helicopter

company was that the armored vehicles of both sides were nearly intermixed. Aviators found it nearly impossible to differentiate between friendly and enemy vehicles. Aviators maintained direct FM communications with Colonel Higgins to coordinate fires¹⁸.

As the close fight continued, the division Fire Support Element targeted 20 Iraqi artillery and armored locations and transmitted them to A-40 FA. The method of control of fires was 'when ready,' but the battery was directed to check-firing at 2230 hours in preparation for an AH-64 attack against a reinforcing Iraqi armored column. The artillery targets were located 28-30 kilometers in the enemy's division rear and to range them A-40 again moved back into enemy direct-fire range¹⁹.

At 2300 hours all artillery in the 2d Brigade ceased firing as an AH-64 battalion overflew the brigade and destroyed a reinforcing tank column maneuvering to counterattack into the 2d Brigade's left flank. This was 3AD's first aviation deep attack of the conflict. The check firing of the division's artillery was an example of the problem in synchronizing the activities of interacting units in deep attacks.

As the fight continued, Major General Funk concentrated his helicopters and artillery on the close fight, attacking the three kilometer deep trench-works forward of 2d Brigade²⁰. North of Third Armored Division, Major General

Griffith and the First Armored Division were also conducting a combination of deep and close attacks with attack helicopters and MLRS.

As 1-1 Cavalry Bradleys made contact with elements of the Adnan division, approximately 50 kilometers in front of the 1AD, Major General Griffith ordered a disengagement of the Cavalry with 3-1 Aviation. As 3-1 Aviation approached the location of 1-1 Cavalry, the commander of A Company, 3-1, located thirty to forty vehicles six kilometers further to the front. 3-1 Aviation pressed the attack and destroyed elements of the Adnan Division, in the division's first deep attack of the conflict.

The following day, 27 February, 1991, 3-1 Aviation changed from the role of deep attack to close air support. Colonel Montgomery Meigs, commander of 2d Brigade 1AD, faced the Medina's 2d Brigade and part of a brigade from the Adnan Division. This engagement became known as the Battle of Medina Ridge, the largest tank engagement of Desert Storm. To help destroy the armored vehicles arrayed in a reverse-slope defense, Colonel Meigs requested air support. 3-1 Aviation responded in an OPGON role and positioned by hovering thirty feet over a task force in the 2d Brigade's battle line. The AH-64s provided support by fire as ground task forces attacked the prepared defenses.

Ironically, communications problems between tanks and helicopters combined with the visibility problems generated

by smoke and dust terminated the use of helicopters in the close fight. Major General Griffith sent 3-1 Aviation deeper in zone to attack targets beyond the scope of the Medina Ridge fight²³. The irony was the commanders' desire to continue to employ helicopters as extended-range tanks from support-by-fire positions.

These engagements have several command and control characteristics in common. The first is that the engagements were not deep in terms of distance. In both the 1AD and 3AD engagements the deep attacks were in view of ground troops and witnessed by Major General Funk in the 3AD deep attack²⁴. The second characteristic is that the engagements resembled movements to contact followed by meeting engagements and hasty attacks.

The deep fight is a dimension of battle that requires as much effort and time to plan and coordinate as a close battle. A false assumption made by ground maneuver commanders is that since attack aviation maneuvers rapidly because it is not subject to the restriction of the earth's surface, the staff planning process for attack aviation is more rapid than a ground unit. This is not so. An aviation unit plans missions using the same decision-making process as other combat units and requires time and liaison to coordinate the details²⁵.

In the Battle of Medina Ridge the combat decisions were made from the front, by members of the TAC and the Command

Group as was appropriate in a hasty attack. To streamline coordination, brigade commanders received operational control over attack helicopters and were responsible for coordination within their zone. Colonel Meigs could observe his troops and the enemy so coordination was less difficult than if limited visibility or extended distances were involved.

The unfamiliarity with new intelligence gathering systems reduced the potential for divisional deep attacks. Units such as First Infantry Division learned to use TROJAN just 24 hours prior to the ground war. Division commanders demanded tactical information from the newly developed JSTARS and UAVs to construct a perfect picture of the battlefield. Battlefield dissemination of these new intelligence products was slow. Commanders gained their best intelligence from their scouts and forward units and directed all combat power against known targets.

The slowly developing tactical picture of the battlefield was a major reason that Desert Storm division commanders could not coordinate a deep fight. Commanders, such as Generals Funk and Griffith had a relatively clear picture of the close fight. They focused their attacks on enemy formations that were in contact with their ground units or enemy units that were soon to enter the close fight. As targets were identified by higher echelons, such as the JSTARS 'hit' on the armored column transmitted to

Major General Funk by VII Corps, commanders alternately shifted assets to fight deep.

During Desert Storm the combat effectiveness and reliability of systems such as the AH-64 and MLRS were verified. The new intelligence gathering systems demonstrated the potential for future conflict. Division commanders realized that they needed to develop the missing aspect of the tactical deep fight: the coordination at the division level required to decide, detect and deliver combat power at uncommitted enemy forces. The place to exercise the deep battle and discover the dynamic complexities of fighting battles close and deep simultaneously was in collective training, specifically, the National Training Center at Fort Irwin.

In 1992, the Senior Trainers of Operations Group at the National Training Center instituted an expanded program for division deep operations involving artillery and aviation. The results of the initiative highlighted the complexities involved in employing forces forward of the FLOT.

The new program offered heavy divisions to deploy two brigades to the National Training Center (NTC) instead of the single ground maneuver brigade. The second brigade was the Aviation Brigade, consisting of the Brigade Headquarters, Attack Helicopter Battalion and the General Support Aviation Battalion.

The training strategy was to employ the aviation units

in a combination of live-fire and force-on-force exercises under control of the '52d Mech Division,' a division staff formed by the NTC scenario writers and controllers. The ground maneuver brigade also had the opportunity to employ the Attack Helicopter Battalion in the role of operational control, both in live-fire and force-on-force battles. The climax of the exercise was an aviation attack against an actual Soviet air defense array at the neighboring China Lake Naval Air Station.

The training environment at the NTC required detailed resolution of coordination problems as well as target acquisition difficulties that were not always evident in simulations or 'REFORGER'-type exercises of the past. In the live-fire engagements the cannon artillery fired suppression missions on enemy air defense weapons and fired rocket-assisted projectiles (RAP) to support the aviators in the engagement areas. The attack battalions fired live munitions in conjunction with USAF close air support.

The force-on-force missions required staffs to coordinate air corridors and passage points through ground maneuver forces in contact with the Opposing Forces (OPFOR). Staffs recognized they needed to resolve conflicts in routing that placed air corridors over future artillery positions. The simulation technology at the NTC permitted units to fire artillery, including MLRS, without the danger of actual fratricide. The battlefield effects, through the

Multiple Integrated Laser Effects System (MILES), were realistic in adjudicating engagements with the OPFOR including direct and indirect fires.

The lessons learned from these battles and engagements at the NTC illustrate the complexity of conducting a division deep fight. A brief discussion will follow on each of the following aspects of division deep battle:

- Command, Control and Communications.
- Target Acquisition (OH-58D, and NAI)
- Air Corridors
- SEAD

The first step in planning a deep attack is to determine the requirements to command and control the unit in the attack. Operating at extended distances requires extraordinary measures to maintain communications. The communications link to division is critical for synchronization of indirect fires and intelligence updates. The most successful technique for communicating is using a retransmissions helicopter and a ground retransmissions station as a redundant means. Aviation Brigade and Battalion Commanders control the operations from aerial tactical command and control centers within radio contact of the attack helicopters. Commanders also employ ground TACs, usually collocated with the ground retransmissions vehicle, as a backup means of control.

The most difficult aspect of a deep attack is timing

the attack to intercept a moving enemy at a preplanned engagement area. Commanders have overcome this problem by timing their activities in concert with the enemy's. Units develop a Decision Support Template that sequences the helicopter battalion's advancing readiness conditions to the progress of the enemy movement. The enemy is tracked through a series of Named Areas of Interest (NAIs), usually observed by Aviation Brigade or divisional assets. Because of the limited time on station for the attack battalion, posed by the fuel constraints, the timing for the attack must be precise.

Attack battalions have had difficulty locating moving formations of enemy vehicles during periods of limited visibility, even when arriving in their battle positions when the enemy is in view. To solve this difficulty, aviation brigades have task-organized the attack unit to include OH-58D aircraft as observers. The OH-58D has superior optics to the AH-64. A successful technique has been to use the OH-58D aircraft to observe NAIs in the vicinity of the engagement area prior to the attack. As the AH-64 aircraft occupy battle positions overlooking the engagement area, the OH-58Ds conduct a battle handover and designate the enemy formation for the AH-64s.

Designating and coordinating the air corridors through the division zone or sector is a problem that requires centralized planning. The difficulty is in not overflying

active artillery positions². In practice, the air corridors are disseminated from division to maneuver brigades and division artillery, they are not, however, usually posted in the artillery battalion TOCs or fire direction centers. Graphics dissemination shortfalls result in two battlefield discoveries. The first discovery is that a deep attack is planned to overfly battery locations. The options available are to either change the air corridor, move the artillery, or check-fire the artillery while the portion of the corridor in debate is active. One of these choices usually leads to the second discovery: interruption of the artillery by displacement or check-firing seriously affects a scheme of fires, frequently one that supports the deep attack! Check-firing the artillery was the same problem that 3rd Armored Division faced during Desert Storm during their aviation deep attack. The air corridor coordination issue remains a problem with tactical units. Successful solutions include proactive checks from division to ensure wide dissemination of the plan and detailed rehearsals including representation from division artillery.

NTC scenarios exercise enemy air defenses for units to destroy, neutralize or suppress in conjunction with a deep attack. In some missions attack battalion commanders decided to rely on stealth and speed in penetrating the enemy defenses and refuse a SEAD program that could attract enemy attention to the mission. This technique was usually

successful in lightly defended areas. When commanders plan to suppress enemy air defenses at the NTC, the key to success is timing the indirect fires.

A successful technique in triggering SEAD is linking the fires to the Decision Support Template. Units plan for SEAD as the attack battalion executes an event, such as reporting passage of an air coordination point (ACP). Attack battalion S-3s can produce a Doppler navigation card for the air route to aid the fire support officer in determining the beginning and the end of SEAD. The advantage of this technique is that the timing of fires is based on the progress of the attack battalion on its corridor between the assembly area and the passage of the FLOT (F-hour). The battalion should maintain preplanned progress, without interruption. Less effective means to time SEAD are basing the fires on time alone. There are potential delays to be expected, such as problems exiting the forward arming and refueling point (FARP). These delays will always require coordination for time adjustment. Another less effective method is on-call fires. This requires the artillery to remain ready-to-fire at the aviators command. At-my-command missions deny other artillery missions because cannons and launchers are laid on targets. Additionally, for a commander to determine when to trigger indirect fires while flying at 120 knots in limited visibility requires tremendous skill.

The preceding discussion illustrates the complexities involved in conducting divisional deep attacks. Because the National Training Center creates a realistic environment down to the lowest tactical levels, the lessons learned on deep attacks are applicable when determining how to plan and control deep attacks at a division level. To ground and aerial maneuver brigades and battalions training at the NTC, the coordination requirements between adjacent units are satisfied by the controllers in the role of a division headquarters. The challenge in the division staff is to determine what type of command and control relationship and task organization is appropriate for a deep attack and how to synchronize the elements of the battlefield operating systems to support the deep attack in addition to the close fight.

IV. Organization and Duties of the Deep Operation

Coordination Center

As we have seen in FM 71-100, divisions have the responsibility to plan and execute deep operations. Divisions are the lowest-level unit to conduct deep operations because they have the weapons and informational capabilities that subordinate units do not³². Brigades are fully engaged in the close fight and do not have the equipment nor the battlefield visibility to independently conduct a deep attack. Division staffs, by assigning a brigade (such as aviation or DIVARTY) to conduct a deep attack unilaterally, end up losing precious division assets with little combat effect³³. As illustrated in the NTC examples, brigades do not have the influence across the division to create the detailed synchronization for the deep attack.

Although the enemy should be attacked simultaneously in depth, a division only has the staffing and the combat support to focus on one main effort at a time. Depending on the battlefield conditions (METT-T), the deep attack could be the main effort of the division³⁴. The commander should organize the division for combat considering the possibility of deep operations and prepare to weight the main effort to increase the likelihood of success. This could mean task organizing to dedicate fires, intelligence support,

communications and other assets applicable to the mission".

Although not specified by current doctrine, the deep operation is normally planned and executed at the division main command post³⁶. A significant means of increasing the potential for success of a deep operation is through organizing a dedicated staff planning and execution element at the division.

Current doctrine is not clear on staff responsibilities for deep operations. BCTP experience shows that successful deep operations are planned and controlled from the Division Main Command Post because the required communications and intelligence capabilities are available³⁷. The problem is determining how to plan for the deep operation as well as plan for close operations with limited staffing. A quick solution that leads to problems is giving deep operations planning and targeting to the Fire Support Element and the Targeting Team. These staff elements quickly become overwhelmed with the deep planning, and the close operations planning and targeting lapses³⁸. Likewise, the formation of an ad hoc targeting cell to focus the activities of all participants is inefficient and inappropriate in planning for an operation of this magnitude³⁹.

The solution lies in the creation of a new staff cell in the Division Main Command Post that focuses solely on deep operations. This type of cell fills the organizational deficiency that evolved due to the changing battlefield

environment, specifically, the introduction of divisional deep weapons and joint warfare. This staff cell, known in emerging doctrine as the Deep Operations Coordination Cell (DOCC)⁴, has been formed by several divisions to help adapt to the requirements of deep operations.

The underlying premise in forming a DOCC is that the cell should be permanent in organization to deal with the simultaneous engagements across the depth of the battlefield as discussed in the assumptions. Division staffs have formed a DOCC as missions require, with designated personnel and equipment. The DOCC is formed upon receipt of a mission and reports to the Chief of Staff.

Figure 1 illustrates the contents of the Deep Battle Cell (DBC) implemented in the 1st Armored Division Main Command Post⁵. 1st Armored Division Staff forms the DBC to plan and execute the deep fight. The cell is co-chaired by the FSCoord and the Aviation Brigade Commander. In this example the Aviation Brigade Commander and staff representatives conduct the mission analysis and brief the Division Commander. The FSCoord and the FSE coordinate with corps for additional mission support and develop the targeting criteria and attack guidance. The G3 and the operations staff assist the cell with all operational planning and coordination, ensuring synchronization. The G2 tracks the intelligence requirements for the operation⁶.

-
- Division Artillery Commander (FSCoord)
 - Aviation Brigade Commander/ Executive Officer
 - G3 or G3 Representative
 - Assistant Division ADA Officer
 - Deputy FSCoord with Division Fire Support Element (FSE)
 - Army Airspace Command and Control (A²C²) Representative
 - Division Air Liaison Officer (ALO)
 - Aviation Brigade Representatives: S3, Fire Support Officer, S2 and ALO

Deep Battle Cell, 1st Armored Division.

The 1st Armored Division's DBC meets in the deep operations van. This equipment is activated specifically when the staff plans a deep attack. The van is located within the Division Main Command Post, adjacent to the FSE, G3 Plans, and the Division Airspace Management Element⁴⁰. When the cell is not active, the van is maintained with minimum manning for readiness for the next deep operation.

Considering the 1st Armored Division's technique for planning and controlling deep operations, what is the best way to organize staffs to increase mission effectiveness and speed coordination? Emerging doctrine places the responsibility on the division commander to structure his

DOCC as the mission requires⁴³

In recognition of the critical nature of simultaneous engagements for the division, doctrinal writing reflects the examples of the 1st Armored Division's initiatives in staff structure. The Draft 71-100, Division Operations, recommends DOCC responsibilities and structure.

The draft manual emphasizes the importance of the commander's intentions in the deep operation. Rarely, if ever, will the division commander personally lead the deep operation. During the Second World War, Major General John S. Wood, commander of the 4th Armored Division was occasionally able to command his deep maneuver from the front. Operating from an aircraft, he maintained communications with his subordinates, but such contact was minimal⁴⁴. MG Wood succinctly communicated his intent prior to the operation. Even with deep ground maneuver during World War II, this commander recognized that the close battle was where his immediate attention was required. In contemporary battle, the commander should continue to focus his attention on the main effort of the division and clearly express his intentions for deep operations⁴⁵.

The mission of the DOCC is to give continuous interactive command and control to the [division], driven by the commanders intent, missions and events⁴⁶. The concept is for the personnel operating within the cell to plan and integrate specific deep operations, while constantly

interfacing with all of the staff and higher headquarters. The DOCC is often configured to monitor close and rear operations and continually assess their relationship with planned deep operations⁴⁶. The DOCC focuses all units, agencies and cells involved in the support of the deep operation. This technique lends standardization to the planning process by ensuring consistency throughout all operations.

FM 71-100 (Draft) lists the functions⁴⁶ of the DOCC in the following figure.

-
- Plan, coordinate and synchronize.
 - Develop courses of action.
 - Monitor execution of the deep fight.
 - Identify high payoff targets.
 - Identify requirements.
 - Nominate targets.
 - Recommend changes to attack guidance matrix.
-

Functions of the DOCC

A critical function of the DOCC is the targeting process. The forthcoming 71-100 does not discuss the DOCC targeting process in terms of the Decide, Detect, Deliver and Assess methodology. The targeting process is viewed in a different aspect since the deep operation is usually in competition with the close fight for collection assets. The

key to partially solving the collection constraint is the integration required by 71-100 between the DOCC and the Division Main staff (the integration between the deep and close battles).

At the beginning of the operation (the decide phase), and throughout the duration, the G2 representative within the DOCC should publish a listing of High Value Targets (HVT) for the upcoming deep operations. The purpose of the HVT is to focus the targeting effort in assessing the availability of collection assets. From the HVT the DOCC personnel determine the High Payoff Targets (HPT) and recommend the attack guidance.

During the detection the phase the DOCC tasks the collection assets and processes the intelligence. Throughout target detection the intelligence picture of the battlefield is constantly updated and refined. The DOCC validates target data and determines if the original decide criteria remains in place with regard to the overall operation.

Finally, the deliver phase is the DOCC linking the sensors to shooters and engaging the target. The DOCC controls the execution of the engagement, keeps the commander informed of the progress and reduces the unnecessary redundant attacks on targets. The DOCC assesses the results of the mission in terms of effectiveness and determines if additional attacks are necessary. In addition

to assessment of BDA, the DOCC should provide the link for the transfer of the results of the deep operations to subordinate units for its effect on the conduct of the close battle.

Another function of the DOCC that is not specified in forthcoming doctrine is its role in establishing fire support coordinating measures or command measures. As demonstrated at the NTC, units conducting deep operations need relative protection from friendly fire when penetrating the FLOT and in subsequent operations. The division Coordinated Fire Line (CFL), normally a permissive measure, is an item which needs modification or cancellation with continuous deep operations. The DOCC could recommend several options to protect the attacking unit, such as establishing a boundary or a restrictive fire line (RFL). The responsibility for initiating the action should be that of the DOCC, as the lead for mission planning³¹.

Regarding staffing of the DOCC, FM 71-100 (Draft) maintains that "it may be formed by linking selected staff members from appropriate main CP cells, either physically or electronically, under the direction of the division chief of staff. The division commander determines the configuration of the DOCC from his assessment of mission requirements, available personnel, and equipment capabilities. However the DOCC is not ad hoc. It is a trained entity³². The following figure lists an example of manning.

-
- G3/G2
 - DIVARTY
 - Aviation Brigade
 - ADA Officer
 - Air Liaison Rep
 - Psyops Rep
 - EW Officer
 - Assist Div Engineer
-

DOCC Manning

It is evident that the doctrinal developers have left the organization of the DOCC to the needs of the command. The determination of the composition and permanence of the DOCC is actually an exercise in risk analysis. Commanders recognize that although the battlefield has expanded in depth and time, the size of their staff has not. Organizing a DOCC, such as that of 1st Armored Division, must be accomplished at the expense of other division organizations. FM 71-100 (Draft) implies that the personnel organization of the DOCC can vary from mission to mission. This would not work in a situation such as Desert Storm, where divisions fought their deep assets continuously and complicated the planning efforts by employing them close and deep interchangeably. In a Desert Storm conflict, characterized by mobile offensive operations, the DOCC could not be tailored mission-to-mission.

Army doctrine maintains that operations will be those of force projection, where versatility is a component of success. The DOCC organization should be, therefore,

permanent and augmented with on-call personnel, or organized according to Standing Operating Procedures levels of response.

It is generally accepted that constant organizational changes reduce efficiency. The changing manning structure for a DOCC would possibly negate any benefits gained from forming the organization in the first place. Changing a staff cell according to missions tends to damage continuity and training. The solution could be to rely strongly on a well-written and current SOP and increased amount of rehearsal. The problem is that these methods still will not replace the system of a permanent organization.

The first method in organizing a DOCC follows the example of 1st Armored Division and of the emerging doctrine of FM 71-100 (Draft). The DOCC equipment could be operational with minimum manning and augmented with on-call personnel as necessary. FM 71-100 (Draft) specifies the deep operations coordinator as the person with the authority to plan and integrate the specified deep operation⁵³. The manual does not specify who this person is but it could be the basis for the permanent cell. Upon activation for the mission the coordinator determines the requirements for augmentation. The DOCC is then augmented with the representatives from DIVARTY and the Aviation Brigade, who remain until completion of the mission execution.

The advantage of this method of organization is that

the DOCC has a core of responsible personnel, such as the coordinator, to maintain the equipment and the readiness of the cell. The division does not have to dedicate the full compliment of manning except when a mission is pending. The disadvantage is that adequate personnel are not readily available and those filling the DOCC still retain their previous responsibilities.

Another method of manning the DOCC could be in standardizing the organization depending on the type of mission. The DOCC could form in three different and growing varieties. The first would be personnel required to support a deep fire program. The second would support an aviation deep attack with supporting fires. The third would form to support an attack with non-divisional and joint assets, or any other combination of combat power. This method for manning the DOCC could be based on the F-hour sequence or phasing of the operation.

This second method builds permanent organizations that can train and rehearse according to the SOP, but only organize for planning of a certain type of mission. The DOCC to support deep fires is actually the core manning and would be a permanent standing organization. The aviation attack manning serves to augment the deep fires team and the joint/non-divisional team encompasses almost all possible DOCC members.

The two forms of manning a DOCC appear similar. The

difference is that the second method adds rigor to the manning and, therefore, would aid training and rehearsing in addition to providing continuity. The continuity is critical in providing the integration with the staff, agencies and units supporting the deep operation as specified in FM 71-100 (Draft). The continuity establishes routines in information processing and patterns of communication.

V. Conclusion and Recommendations

The Army has determined, as indicated in emerging doctrine, that to satisfy the requirements of the expanding battlefield, divisions need to organize a deep operations cell. Divisions have anticipated the requirement and have begun to organize and adapt. Some divisions have created semi-permanent coordination centers tailored to satisfy short-term exercises and events such as BCTP.

The need for the DOCC is evident from the analysis of Operation Desert Storm. Division commanders, not readily able to visualize the enemy formations beyond the FLOT, nor able to rapidly coordinate the details of FLOT passage and fire support coordinating measures, subordinated their long-range weapons to brigade commanders. In Desert Storm, the deep attack was: pursued with blanket coordination, such as 3AD check-firing artillery, or executed when the frustrations of close fight coordination caused 1AD to break-off 3-1 Aviation from close battle and send them deep in search of targets. Desert Storm provided short-duration combat testing of doctrine and new weapons. The lessons from the war indicate that a DOCC could increase the mission effectiveness by speeding the detailed coordination required for a deep attack.

The brevity of the ground war did not test the staff in providing deep operations planning and control over an

extended duration, considering the simultaneous nature of deep and close operations. While an analysis of Desert Storm reinforces the need for a DOCC, the duration of the ground war does not support forming a permanent DOCC. The limited number of deep attacks in a short-duration war could be planned and executed by a temporary, on-call DOCC. What about extended combat duration?

The measures that units like the 1st Armored Division are executing are effective in the joint environment but can they be sustained? Under high-tempo, continuous operations the staff manning the DBC could become less efficient as they attempt to split their focus and duties between the close and deep battles. Organizing the DOCC based upon the requirements of each mission could become too overwhelming for the supporting staff if the next war is fought as FM 100-5 anticipates.

A permanent DOCC is the preferred solution for extended duration combat operations. The constraint limiting a permanent institution is the additional personnel needed to staff the DOCC. Doctrine writers assume that division structures will not change to accommodate additional personnel or slots for the DOCC. For this reason the writers of FM 71-100 (Draft) have given commanders latitude in forming a DOCC.

Commanders can organize their staffs to plan and control deep attacks more effectively by satisfying several

criteria.

The first is that the organization and function of the DOCC should be documented in the SOP. The attempt is not to limit the flexibility of the commander or the chief of staff in forming the DOCC, but to specify personnel for DOCC duty for training. Commanders should designate specific positions within the division as providers for the DOCC upon activation. This action enhances flexibility for the subordinate staffs and commands by notifying them of additional mission responsibilities (or tasking) in the SOP. Predesignating DOCC positions helps subordinates facilitate planning for future operations.

The second criteria is for the DOCC to conduct training with the division during command post exercises. The DOCC personnel can establish linkages and patterns of correspondence and communication within the division to facilitate the detailed coordination for deep operations. The integration of the DOCC during exercises should be documented in the division SOP and enforced in subsequent exercises. The enforcement of the SOP is not to limit flexibility and imagination, only to provide continuity within the division to ease the impact of personnel rotation between exercises and events.

The third criteria is that the personnel in the DOCC should have the knowledge and the authority to coordinate outside of the division with joint headquarters. An

assumption is that the division may employ joint assets. The division has the responsibility to plan for the employment and support of these assets as required. The DOCC personnel should be skilled in the duties of joint capabilities coordination.

A recommendation for creating a DOCC structure while meeting these three criteria is the tiered organization outlined previously and displayed below.

•Level One	Deep Fires
•Level Two	Aviation/Fires
•Level Three	Joint Attack

Tiered DOCC Organization

The tiered method establishes responsibility for staffing the DOCC depending on the mission as FM 71-100 (Draft) requires. This method provides a capable staff to plan the deep attack without requiring a full staffing for the less complicated missions. The commander can still provide adequate staffing for a mission, but, without always requiring the entire complement of DOCC personnel.

The changing nature of deep operations provides a challenge for the commander and staff of the division. The DOCC is the first formal step in the evolution of the staff structure to focus on planning and controlling division deep operations within a single staff agency. The changing

nature of technology may provide the catalyst for the Army to provide the additional personnel and equipment for a permanent DOCC within the division structure. The division DOCC will continue to increase in significance in future conflicts.

Endnotes

1. Mikhail Tukhachevskiy, "New Problems in Warfare," in Art of War Colloquium, (Carlisle Barracks, PA: U.S. Army War College, 1983): 18.
2. Eliot A. Cohen and John Gooch, Military Misfortunes: The Anatomy of Failure in War, (New York, NY: The Free Press, 1990), 26.
3. Christopher R. Gabel, The 4th Armored Division in the Encirclement of Nancy (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1986), 23.
4. Appendix 4 (Deep Operations) to Annex C (Fire Support) to Part 1 of I Corps Field Standing Operating Procedures by the 1st U.S. Corps (privately published, 1994), C-4-2.
5. Ibid.
6. Ibid.
7. Ibid.
8. U.S. Department of the Army, FM 100-5 Operations, (Washington, D.C.: Government Printing Office, 1993), 1-4.
9. U.S. Department of the Army, FM 100-5 Operations, 2-2.
10. Ibid.
11. U.S. Department of the Army, FM 100-5 Operations, 2-7.
12. Ibid.
13. U.S. Department of the Army, FM 71-100 Division Operations, (Washington, D.C.: Government Printing Office, 1990), 1-6.

14. Ibid.
15. Brigadier General Robert H. Scales, Certain Victory: The US Army in the Gulf War, (Washington, D.C.: Government Printing Office, 1993), 280.
16. Scales, 275.
17. Scales, 280.
18. Scales, 275.
19. Author's unpublished record of the battle, 1991.
20. Scales, 275.
21. Scales, 293.
22. Scales, 299.
23. Ibid.
24. Scales, 276.
25. U.S. Department of the Army, FM 1-111 Aviation Brigades, (Washington, D.C.: Government Printing Office, 1990), 2-4 - 2-5.
26. Scales, 293.
27. Scales, 372.
28. U.S. Department of the Army, FM 1-111 Aviation Brigades, 2-25 - 2-26.
29. Captain Rick Richardson "Aviation Brigade S2 and FSO Integration in the Targeting Team," Center For Army Lessons Learned Newsletter Fighting With Fires II, No. 95-10 (1995): 4.
30. U.S. Department of the Army, Corps Deep Operations Handbook, (Fort Leavenworth KS: TRADOC Program Integration Office, 1990), 4-50 4-54.
31. U.S. Department of the Army, FM 1-111 Aviation Brigades, J-34.
32. COL Harry M. Emerson, III, and MAJ Michael T. Edwards, "Deep Operations: A Look From BCTP at the Process," Combined Training Centers Bulletin, No. 94-1 (1994): 23.
33. Ibid.
34. Emerson, 24.

35. U.S. Department of the Army, FM 71-100 Division Operations, 1-7 - 1-8.
36. Emerson, 23.
37. 1994 BCTP Perceptions, (Fort Leavenworth, KS: BCTP, 1994), 82.
38. BCTP Warfighter Seminar observation by author, September 1995.
39. MAJ Rick Pena, MAJ Kevin Whitlatch, and MAJ Mark Sheppard, New Doctrine on Deep Battle Coordination, (Fort Leavenworth, KS: Corp and Division Doctrine, 1995), 5.
40. U.S. Department of the Army, FM 71-100 Division Operations (Draft), (Fort Leavenworth, KS: Corps and Division Doctrine, 1995), 2-21.
41. MAJ Forest D. Haynes III, "Synchronizing the Deep Fight," Field Artillery (April 1993): 22.
42. Ibid.
43. Ibid.
44. U.S. Department of the Army, FM 71-100 Division Operations (Draft), 2-21.
45. Gabel, 23.
46. U.S. Department of the Army, FM 71-100 Division Operations (1990), 1-10.
47. U.S. Department of the Army, FM 100-15 Corps Operations (Draft), (Fort Leavenworth, KS: Corps and Division Doctrine, 1995), 4-12.
48. U.S. Department of the Army, FM 71-100 Division Operations (Draft), 2-21.
49. Ibid.
50. I Corps Field Standing Operating Procedures, C-4-3 - C-4-4.
51. Appendix 8 (Deep Operations) to Annex A (Operations) to Part 1 of III Corps Tactical Standing Operating Procedures by the 3rd U.S. Corps (privately published, 1995), I-A-8-2.
52. U.S. Department of the Army, FM 71-100 Division Operations (Draft), 2-21.

53. U.S. Department of the Army, FM 71-100 Division Operations
(Draft), 2-22.

Bibliography

Manuals

- U.S. Department of the Army. Battle Command, Leadership and Decision Making for War and Operations Other Than War, Draft 2.1. Fort Leavenworth, KS: Battle Command Battle Laboratory, 1994.
- U.S. Department of the Army. Corps Deep Operations Tactics, Techniques and Procedures Handbook (1990). Fort Leavenworth, KS: USA Combined Arms Combat Developments Activity, 1990.
- U.S. Department of the Army. Field Manual 1-100, Doctrinal Principle for Army Aviation in Combat Operations. Washington, DC: Government Printing Office, 1989.
- U.S. Department of the Army. Field Manual 1-111, Aviation Brigades. Washington, DC: Government Printing Office, 1990.
- U.S. Department of the Army. Field Manual 6-20-2, Tactics, Techniques, and Procedures for Corps Artillery, Division Artillery, and Field Artillery Brigade Headquarters. Washington, DC: Government Printing Office, 1993.
- U.S. Department of the Army. Field Manual 6-20-30, Tactics, Techniques, and Procedures For Fire Support For Corps and Division Operations. Washington, DC: Government Printing Office, 1989.
- U.S. Department of the Army. Field Manual 71-100, Division Operations. Washington, DC: Government Printing Office, 1990.
- U.S. Department of the Army. Field Manual 71-100, Division Operations (Draft). Fort Leavenworth, KS: Corp and Division Doctrine Department, 1995.
- U.S. Department of the Army. Field Manual 100-5, Operations, 1993. Washington, DC: Government Printing Office, 1993.
- U.S. Department of the Army. Field Manual 101-5, Command and Control for Commanders and Staff, Final Draft. Washington, DC: Government Printing Office, 1993.

- U.S. Department of the Army. Field Manual 101-5-1, Operational Terms and Symbols. Washington, DC: Government Printing Office, 1985.
- U.S. Department of the Army. FM 100-15, Corp Operations (Draft). Fort Leavenworth, KS: Corps and Division Doctrine, 1995.
- U.S. Department of the Army. Fundamentals of Tactical Operations. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1994.

Books

- Appelman, Roy E. The U.S. Army in the Korean War: South to the Nakdong, North to the Yalu. Washington, DC: Center for Military History, United States Army, 1986.
- Atkinson, Rick. Crusade. Boston: Houghton Mifflin Company, 1993.
- Clausewitz, Carl von. On War, Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.
- Bellamy, Christopher. The Evolution of Modern Land Warfare, Theory and Practice. London: Routledge, 1990.
- Bellamy, Christopher. The Future of Land Warfare. New York: St Martin's Press, 1987.
- Cohen, Eliot A. and John Gooch. Military Misfortunes: The Anatomy of Failure in War. New York: The Free Press, 1990.
- Gabel, Christopher R. The 4th Armored Division in the Encirclement of Nance. Fort Leavenworth, KS: Combat Studies Institute, 1986.
- McKnight, Clarence E., ed. Control of Joint Forces, A New Perspective. Fairfax, VA: Armed Forces Communications and Electronics Association International Press, 1989.
- Scales, Robert H., Brigadier General, USA. Certain Victory: The U.S. Army in the Gulf War. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1994.

- Swain, Richard M. "Lucky War" Third Army in Desert Storm.
Fort Leavenworth, KS: U.S. Army Command and General
Staff College, 1994.
- Van Creveld, Martin L. Command in War. Cambridge, MA:
Harvard University Press, 1985.

Articles

- Baker, Daniel F. MAJ, USA. "Deep Attack: A Military
Intelligence Task Force in Desert Storm." Military
Intelligence, Volume 17 No. 4 (October-December 1991)
39-42.
- Cline, Dennis C., COL, USA and LTC Joe G. Taylor, Jr. "Deep
Interdiction -- The MLRS Deep Strike Option." Field
Artillery, (April 1993): 26-31.
- Emerson, Harry M. III, COL, USA and MAJ Michael T. Edwards.
"Deep Operations: A Look From BCTP at the Process."
Combat Training Centers Bulletin No. 94-1, (March
1994): 21-31.
- Hanner, Dale R., LTC, USA. "Integration of Deep Attack."
U.S. Army Aviation Digest, No.1 (January-February
1993): 8-12.
- Hayes, Michael T., LTC, USA and MAJ Robert P. Lott.
"Fighting With Fires, Fire Support Trends." National
Training Center's Newsletter No. 95-6, (May 1995): 1-
15.
- Haynes, Forest D., III, MAJ, USA. "Synchronizing the
Divisional Deep Fight." Field Artillery, (April 1993):
21-25.
- Kolditz, Thomas, MAJ, USA and COL Niel E. Nelson. "RAIDS-
Fire Coordination for Aviation in the Deep Battle."
Field Artillery, (February 1995): 24-26.
- McCabe, Thomas R., MAJ, USAF. "Limits of Deep Attack."
Airpower Journal, Volume 7 No. 3 (Fall 1993): 4-14.
- Richardson, Rick, MAJ, USA. "Aviation Brigade S2 and FSO
Integration in the Targeting Team." Center for Army
Lessons Learned Newsletter Fighting With Fires II
No 95-10, (1995): 4.

Soniak, Robert W., MAJ, USA. "Aviation Deep Battle Operations at the National Training Center." U.S. Army Aviation Digest, (July-August 1991): 42-45.

Tackaberry, Kief S. "Deep Attack and the Counterartillery Battle." U.S. Army Aviation Digest, (January-February 1992): 6-13.

Manuscripts

Armor, A.M., MAJ, USA. "Light Armor in Deep Operational Manuever: The New Excalibur." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1994.

Bond, W.L., COL, USA. "Targeting for the Deep Attack." Executive Research Project. Industrial College of the Armed Forces, Washington DC, 1992.

Crawford, D.E., MAJ, USA. "Deep Operations in Airland Battle Doctrine: The Employment of U.S. Ground Forces in Deep Operational Maneuver." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1989.

Francis, E.J. "Is Current Fire Support Doctrine for the Deep Battle Effective in the Post Desert Storm Environment?" Master's Thesis. U.S. Army Command and General Staff College, 1993.

Gruner, Glenn A., MAJ, USA. "The Military Technical Revolution--Can Corps Deep Operations Now Independently Achieve Battle Objectives?" Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1992.

Hasbrouch, A.P. "Third Dimension Deep Operations Impacts and Implications." Study Project. U.S. Army War College, Carlisle Barracks, PA, 1990.

Jacobs, William M., MAJ, USA. "Massing the Third Dimension in Air-Land Battle- Future: The Aviation Division." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1991.

Leaf, D.P. "Unity of Command and Interdiction." Unpublished Paper. Air University, Maxwell Air Force Base, AL, 1994.

- Mitchell, R.V., COL, USA. "Army Aviation Deep Attack Routes: Planning and Selection." Individual Studies Project. Army War College, Carlisle Barracks, PA, 1990.
- Mixon, Robert W. Jr., MAJ, USA. "Taking the Ultimate Risk: Commanding and Controlling Maneuver Forces in Tactical Deep Operations." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1986.
- Olson, W.E. "AirLand Battle Execution -- Some Implications of Deep Attack." Student Essay. U.S. Army War College, Carlisle Barracks, PA. 1984.
- Pearson, Craig H., MAJ, USA. "Joint Army Aviation/Air Force Deep Operations at Night." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1985.
- Pickar, C.K., MAJ, USA. "Tactical Deep Battle: The Missing Link." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1991.
- Simmons, J.E. "Attack Helicopter Battalion: Ready for the 60's or 90's." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1989.
- Sinclair, Edward J., MAJ, USA. "Attack Helicopters: Airland Battle Future's Sword of Vengeance." Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, 1990.

Other Works

- I Corps Field Standing Operating Procedures. Privately published by the 1st U.S. Corps, 1994.
- "1994 BCTP Perceptions." Fort Leavenworth, KS: Battle Command Training Program, 1994.
- "2d Armored Division: Division Deep Operations." Unpublished Presentation. Fort Hood, Texas, 1995.
- III Corps Tactical Standing Operating Procedures. Privately published by the 3rd U.S. Corps, 1995.

Pena, Rick, MAJ, USA, MAJ Kevin Whitlatch, MAJ Mark Sheppard. New Doctrine on Deep Battle Coordination. Unpublished paper by the Corps and Division Doctrine Department, Fort Leavenworth, KS, 1995.

Tukhachevskiy, Mikhail. "New Problems in Warfare." Art of War Colloquium. Carlisle Barracks, PA: U.S. Army War College, 1983.